

RECEIVED  
CENTRAL FAX CENTER

SEP 02 2008

-2-

Amendment to the Claims:

1. (Currently Amended) A radiation detecting apparatus comprising:  
an array of elements for converting individual received radiation  
events into corresponding radiation event signals, one of the radiation converting  
elements being defective;

5 a means for digitizing the radiation event signals from at least non-  
defective elements; and

a ~~means for generating~~ virtual event generator which generates  
radiation event signals for the defective radiation converting element based on the  
radiation event signals from other radiation converting elements of the array by:-

10 assigning at least two of the individual radiation  
converting elements of the array as contributing elements,

selecting a selected one of the contributing elements,

each time the selected contributing element receives a  
radiation event, generating both an event signal for the selected  
15 contributing elements and a event signal for the defective element,

while radiation events are being received, randomly  
changing the selected contributing element.

2. (Original) The apparatus as set forth in claim 1 wherein the  
radiation converting elements each include one of:

solid state detector elements, and

a scintillation crystal and photodiode pair.

3. (Cancelled)

4. (Currently Amended) ~~The~~ A radiation detecting apparatus as set  
~~forth in claim 3~~ comprising:

an array of elements for converting individual received radiation  
events into corresponding radiation event signals, one of the radiation converting  
5 elements being defective;

-3-

a means for digitizing the radiation event signals from at least non-defective elements;

10 a means for assigning at least two of the individual radiation converting elements of the array as contributing pixels whose output signals are supplied to the defective pixel output signal generating means;

a means for generating a radiation event signal for the defective radiation converting element based on the radiation event signals from the contributing pixels, wherein the defective pixel output signal generating means including:

15 a table having a position for each of the contributing pixels;

a means for passing a token among the table positions;

20 a means for receiving the radiation event signals from the contributing radiation converting elements and accessing the table to determine whether the corresponding table position holds the token, in response to the corresponding table position holding the token, generating ~~the~~ radiation event signal for the defective radiation converting element and causing the token passing means to pass the token.

5 5. (Previously Presented) The apparatus as set forth in claim 4, wherein two adjacent radiation converting elements are defective and further including:

two tokens, one corresponding to each of the defective radiation event converting element which the token passing means passes among the table positions.

6. (Cancelled)

7. (Currently Amended) The apparatus as set forth in claim 1, further including:

a means for assigning a radiation energy value to the generated radiation event signals for the defective element pixel.

-4-

8. (Previously Presented) The apparatus as set forth in claim 7, further including:

a means for varying the energy output of the energy output means over a preselected limited range.

9. (Previously Presented) The apparatus as set forth in claim 8, wherein the energy varying means includes:

a means for removing a preselected number of least significant bits of the energy value;

5 a random number generator for randomly generating least significant bits;

a means for replacing the removed least significant bits with the randomly generated least significant bits.

10. (Previously Presented) The apparatus as set forth in claim 1, further including:

a means for reconstructing radiation event information into an image representation;

5 a means for storing the image representation;

a means for converting at least a portion of the image representation into a human readable display.

11. (Currently Amended) A gamma camera comprising:

a two-dimensional array of radiation detector elements which receives incident gamma radiation events and produces corresponding output signals, one of the radiation detector elements being defective;

5 at least one analog-to-digital converter for converting the element output signals into a digital value indicative of spatial location on the array and energy of the incident gamma radiation event; and

a virtual event generator which;

-5-

10                   receives the output signals from contributing radiation  
                  detecting elements of the array,  
                  determines whether the contributing radiation detecting  
                  elements are randomly assigned a token, and  
                  generates digital output signals for the defective  
                  radiation detecting element based on the output signals from ~~other~~  
15                   contributing radiation detecting elements of the array which hold the  
                  token.

12. (Currently Amended) A method of detecting radiation comprising:  
                  receiving radiation events at an array of ~~pixel~~~~pixelated~~ locations and  
                  generating corresponding radiation event signals, at least one of the locations being  
                  defective;  
5                   digitizing the radiation event signals from the non-defective pixel  
                  locations;  
                  ~~generating radiation event signals for the defective detection location~~  
                  ~~based on the radiation event signals from non defective locations~~awarding a token to  
                  at least one of the non-defective pixel location adjacent to the defective pixel location;  
10                   in response to receiving a radiation event signal corresponding to the  
                  non-defective pixel location with the token, generating radiation event signals for the  
                  defective pixel location based on the radiation event signals from the at least one non-  
                  defective locations with the token and transferring the token to another non-defective  
                  pixel location adjacent to the defective pixel location.

13. (Currently Amended) The method as set forth in claim 12, further  
                  including:  
                  irradiating the ~~pixel~~~~pixelated~~ locations with a flood field of gamma  
                  radiation;  
5                   monitoring at least one of the radiation event signals to determine the  
                  defective pixel locations.

14. (Cancelled)

-6-

15. (Cancelled)

16. (Currently Amended) The method as set forth in claim 1215, wherein two adjacent pixel locations are defective, the token awarding step further including:

5       awarding two tokens, one token corresponding to each defective pixel locations, which tokens are passed independently.

17. (Currently Amended) The method as set forth in claim 1215, ~~for each defective pixel location, determining wherein the contributing pixels are nearest neighbors pixel locations~~ and next nearest neighbor pixel locations and wherein the token passing step includes:

5       passing the token among the nearest neighbor pixel locations with a higher frequency than passing the token among the next nearest neighbor pixel locations.

18. (Original) The method as set forth in claim 12, wherein the radiation event signals are indicative of location and an energy of the received radiation event and further including:

5       randomly varying digital energy values corresponding to the defective pixel locations.

19. (Currently Amended)       The method as set forth in claim 18, further including:

5       removing least significant bits of the digital energy value of the radiation event at the ~~contributing non-defective~~ pixel location; and, assigning randomly generated values as the least significant bits.

20. (Original)       The method as set forth in claim 12 wherein the digitized event signal includes array position values indicative of the location in the array that the radiation event was received, and further including:

-7-

reconstructing the digital position values into a three-dimensional  
5 image representation; and  
converting portions of the image representation into a human readable  
display.

21. (Currently Amended) An imaging apparatus comprising:  
a detector including an array of detector elements for converting  
radiation events into corresponding radiation event signals;  
a means for determining defective detector elements of the array; and  
5 a means for assigning detector elements proximate to each defective  
element as contributing detector elements whose outputs form the basis of the  
generating of the radiation event signal for the defective detector elements; and  
a means for generating radiation event signals for defective detector  
elements in response to receiving a radiation event signal corresponding to, based  
10 upon a predefined number of a randomly selected contributing detector element, the  
selected contributing elements changing randomly non-defective detector elements  
proximate said defective detector element.